WHAT IS CLAIMED IS:

1. A method of heating a liquid in an electric kettle having a heating element, a temperature sensor, and an electronic regulator, the method comprising:

sensing a starting temperature at the temperature sensor;

determining a starting temperature differential between the measured starting temperature and a preselected target temperature;

in response to the starting temperature differential being equal to a reference temperature differential, heating the kettle at less than a full power level for a calculated period of time; and

in response to the starting temperature differential being greater than the reference temperature differential, determining an end temperature and heating the kettle until the determined end temperature is sensed at the temperature sensor.

2. The method of claim 1, further comprising determining a heat capacity.

3. The method of claim 2, wherein determining the heat capacity comprises activating the heating element for a predetermined amount of time and then deactivating the heating element, and wherein the heat capacity is a function of a heating output applied by the activated heating element and a measured temperature differential over a predetermined time after the heating element is activated.

4. The method of claim 2, wherein the reference temperature differential is calculated as a function of the heat capacity, an electrical heating output of the heating element, and a delay time, the delay time being an amount of time, after activation of the heating element, that passes before a temperature increase is sensed at the temperature sensor.

5. The method of claim 4, wherein the reference temperature differential is a product of the electrical heating output and the delay time, divided by the heat capacity.

6. The method of claim 1, wherein the determined end temperature is less than the preselected target temperature.

7. The method of claim 1, wherein the starting temperature differential is divided into multiple increments, the number of regions being dependent upon the temperature differential.

8. The method of claim 1, wherein, in response to the starting temperature differential being equal to the reference temperature differential, the kettle is heated at less than a full power level for a calculated period of time such that, upon a first measurable temperature increase, a measured temperature at the temperature sensor is less than the determined end temperature.

9. The method of claim 1, wherein, heating the kettle at less than the full power level comprises intermittently activating and deactivating the heating element.

10. The method of claim 9, wherein activating the heating element comprises heating the kettle at the full power level and deactivating the heating element comprises not heating the kettle.

11. The method of claim 1, wherein the heating element includes multiple heating units, and wherein heating the kettle at less than the full power level comprises deactivating at least one of the multiple heating units.

12. The method of claim 4, wherein the kettle is constructed such that the delay time is approximately equal to a time difference between the liquid actually reaching the determined end temperature and the determined end temperature being sensed at the temperature sensor.

13. The method of claim 1, further comprising determining a sampling temperature difference between a beginning and an end of a sampling time period, the sampling time

period occurring after a delay time, the delay time being an amount of time, after activation of the heating element, that passes before a temperature increase is sensed.

14. The method of claim 13, further comprising determining a temperature gradient as a function of the sampling time period and the sampling temperature difference.

15. The method of claim 14, wherein determining the end temperature comprises extrapolating a temperature curve based on the delay time and the temperature gradient.

16. An electric kettle for heating a liquid, the kettle comprising:

a container defining a cavity for containing the liquid;

a heating element that transmits heat to the liquid;

a temperature sensor responsive to a kettle temperature;

a time sensor; and

a heating regulator configured to, upon activation of the kettle,

sense a starting temperature measured by the temperature sensor;

determine a starting temperature differential between the measured starting temperature and a preselected target temperature;

heat the kettle at less than a full power level for a calculated period of time in response to the starting temperature differential being equal to a reference temperature differential; and

determine an end temperature and heat the kettle until the determined end temperature is measured at the temperature sensor in response to the starting temperature differential being greater than the reference temperature differential.

17. The electric kettle of claim 16, wherein the heating regulator is further configured to determine a heat capacity, the heat capacity being a function of a heating output applied by the heating element and a measured temperature differential over a period of time after the heating element is activated.

18. The electric kettle of claim 16, wherein the heating regulator is further configured to determine a delay time, the delay time being the amount of time, after activation of the heating element, that passes before a temperature increase is measured at the temperature sensor.

19. The electric kettle of claim 16, wherein the heating element includes multiple heating units.

20. A method of detecting a malfunction in an electric kettle for heating a liquid, the kettle including a heating element, a temperature sensor, a heating regulator, and an electronic memory, the method comprising:

sensing a starting temperature at the temperature sensor;

activating the heating element for a selected length of time;

sensing a second temperature at the temperature sensor at the end of the selected length of time;

calculating a temperature differential as a difference between the starting temperature and the second temperature; and

in response to the calculated temperature differential being less than or equal to a reference temperature differential, deactivating the heating element.

21. The method of claim 20, further comprising:

in response to the calculated temperature differential being greater than the reference temperature differential, sensing a third temperature at the temperature sensor at a reference boiling time;

in response to the third temperature being less than a reference boiling temperature, deactivating the heating element; and

in response to the third temperature being greater than or equal to the reference boiling temperature, deactivating the heating element.

22. The method of claim 21, further comprising determining the selected length of time, the reference temperature differential, the reference boiling time, and the reference boiling temperature as functions of an ambient temperature.

23. The method of claim 22, wherein determining the selected length of time, the reference temperature differential, the reference boiling time, and the reference boiling temperature comprises accessing data of a characteristic data matrix stored in the electronic memory.

24. The method of claim 21, further comprising indicating a malfunction if the calculated temperature increase is less than or equal to the reference temperature increase and if the third temperature is less than the reference boiling temperature.

25. The method of claim 24, wherein indicating the malfunction comprises activating an acoustic indicator.

26. The method of claim 21, further comprising measuring a liquid fill level prior to activating the heating element.

27. The method of claim 26, wherein the selected length of time, the reference temperature differential, the reference boiling time, and the reference boiling temperature are functions of the measured liquid fill level.

28. The method of claim 23, further comprising modifying the data of the characteristic data matrix in response to the third temperature being greater than or equal to the reference boiling temperature.

29. The method of claim 28, further comprising determining a power consumption of the heating element over time and a temperature gradient of the liquid over time.

30. The method of claim 21, further comprising storing system errors, wherein, in response to the system errors occurring above a predetermined acceptable frequency, the heating element is deactivated until a memory is reset.

31. The method of claim 30, wherein the system errors include calculating the temperature differential to be less than or equal to the reference temperature differential and sensing the third temperature to be less than the reference boiling temperature.

32. An electric kettle for heating a liquid, the kettle comprising:

a heating element that transmits heat to the liquid;

a temperature sensor responsive to a kettle temperature;

a time sensor;

an electronic memory that stores characteristic data; and

a heating regulator in communication with the memory, the heating regulator configured to

sense a starting temperature measured by the temperature sensor;

activate the heating element for a selected length of time;

sense a second temperature measured by the temperature sensor at the end of the selected length of time;

calculate a temperature differential as a difference between the starting temperature and the second temperature; and

deactivate the heating element in response to the calculated temperature differential being less than or equal to the reference temperature differential.

33. The electric kettle of claim 32, wherein the heating regulator is further configured to

sense a third temperature measured by the temperature sensor at a reference boiling time in response to the calculated temperature differential being greater than the reference temperature differential;

deactivate the heating element in response to the third temperature being less than a reference boiling temperature; and

deactivate the heating element in response to the third temperature being greater than or equal to the reference boiling temperature.

34. The electric kettle of claim 33, wherein the memory comprises a characteristic data matrix including data corresponding to the selected length of time data, the reference temperature differential, the reference boiling time, and the reference boiling temperature.

35. The electric kettle of claim 34, further comprising a microprocessor that updates the characteristic data in response to a system change.

36. The electric kettle of claim 35, wherein the system change is a decrease in heating output of the heating element.

37. The electric kettle of claim 32, further comprising an indicator to indicate a malfunction to a user.

38. The electric kettle of claim 37, wherein the indicator is an acoustic indicator.

39. The electric kettle of claim 32, further comprising a liquid level sensor that measures a level of the liquid in the kettle.

40. The electric kettle of claim 32, wherein the heating regulator is further configured to deactivate the heating element until the memory is reset in response to system errors occurring above a predetermined acceptable frequency.